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Geochemistry of radioactive elements in bituminous sands and sandstones of Permian bitumen deposits of Tatarstan (east of the Russian plate)

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Abstract

© 2018 Institute of Physics Publishing. All rights reserved. The article investigates geochemical features of Permian (Cisuralian, Ufimian Stage and Biarmian, Kazanian Stage of the General Stratigraphic Scale of Russia) bituminous sands and sandstones located on the territory of the Volga-Ural oil and gas province (Republic of Tatarstan). Natural bitumens are extracted using thermal methods as deposits of high-viscosity oils. In the samples studied, the specific activity of natural radionuclides from the 238U (226Ra), 232Th, and 40K series was measured using gamma spectrometry. As a result of the precipitation of uranium and thorium and their subsequent decay, the accumulation of radium (226Ra and 228Ra) has been shown to occur in the bituminous substance. In the process of exploitation of bitumen-bearing rock deposits (as an oil fields) radium in the composition of a water-oil mixture can be extracted to the surface or deposited on sulfate barriers, while being concentrated on the walls of pipes and other equipment. This process requires increased attention to monitoring and inspection the environmental safety of the exploitation procedure.

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Keywords

bitumen sands, bitumen sandstones, concentration, radioactive Elements, tar sands

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